

WO 2004/007318

P(JS2003/021973

- 19 -

1 WHAT IS CLAIMED IS:

- 2 1. A loadport apparatus for transferring semiconductor wafers from the interior
3 of a FOUP having a FOUP door to a semiconductor processing equipment, comprising:
4 a platform configured for securably receiving the FOUP;
5 a housing including
6 an opening to a second chamber,
7 said housing configured for sealably engaging said FOUP when the FOUP
8 is secured to said platform;
9 a loadport door including
10 a FOUP door access mechanism for opening the FOUP door,
11 said loadport door movable between an open position and a closed
12 position and where the opening is in direct communication with said second chamber;
13 a loadport door seal for selectively sealing said opening from said second chamber
14 when said loadport door is in said closed position; and
15 a conditioning system in communication with said openings for conditioning a
16 mini-environment chamber defined by an said loadport door, said opening, and the
17 interior of the FOUP when said loadport door is in said closed position, said loadport
18 door seal is sealed, and said FOUP door is open.
- 19 2. The apparatus of claim 1 wherein said loadport door further includes an
20 loadport door recess and said mini-environment chamber is further defined by said
21 loadport door recess.

WO 2004/007318

P /US2003/021973

- 20 -

1 3. The apparatus of claim 2 wherein said FOUP door access mechanism
2 retractably extends from said loadport door recess.

3 4. The apparatus of claim 3 wherein said FOUP door access mechanism includes
4 a door latching capable of extending toward the FOUP door having a removable door,
5 engaging the removable door, and retracting with the removable door into said loadport
6 door recess.

7 5. The apparatus of claim 4 wherein said FOUP door access mechanism further
8 includes a latching assembly for releasably engaging said removable door.

9 6. The apparatus of claim 1 wherein said loadport door seal is coupled with said
10 loadport door.

11 7. The apparatus of claim 6 wherein said loadport door seal is an inflatable seal
12 coupled with said loadport door for sealingly engaging said housing while said loadport
13 door is in said closed position.

14 8. The apparatus of claim 1 wherein said conditioning system includes a gas
15 inlet for providing a first gas to said mini-environment chamber and a gas outlet for
16 discharging the gas from said mini-environment chamber.

17 9. A method for conditioning the interior of a FOUP having a FOUP door, said
18 method comprising:

WO 2004/007318

PC 'S2003/021973

- 21 -

1 extending a FOUP door access mechanism through said opening for engaging and
2 opening said FOUP door;

3 conditioning a mini-environment chamber defined by an loadport door of the
4 process apparatus in a closed position, said opening, and an interior of said FOUP when
5 said FOUP door of said FOUP is open; and

6 unsealing and moving said loadport door from the closed position to an open
7 position thereby communicating the interior with a second chamber through said opening.

8 10. The method of claim 10 further including:

9 moving and sealing said loadport door from said open position to said closed
10 position in sealed engagement with said housing.

11 11. The method of claim 10 further including:

12 extending said FOUP door access mechanism through said housing for closing
13 said FOUP door; and

14 releasing said FOUP from said FOUP platform.

15 12. The method of claim 10 wherein said purging further includes:

16 dispensing a first gas into said mini-environment through a gas inlet; and

17 discharging said first gas from said mini-environment through a gas outlet,

18 wherein said mini-environment chamber is defined for a gas flow between said gas inlet

19 and said gas outlet.

20 13. The method of claim 10 wherein said purging further includes:

WO 2004/007318

PCT/US2003/021973

- 22 -

1 dispensing a first gas into said mini-environment through a gas inlet on said
2 housing; and

3 discharging said first gas from said mini-environment through a gas outlet on said
4 housing, wherein said mini-environment chamber is defined for a gas flow between said
5 gas inlet and said gas outlet.

6 14. The method of claim 10 further including:

7 accessing said FOUP through said opening.

8